CIS 4480/5480 Recitation 1 - Processes, Valgrind and Style

Welcome back to recitation!!! 😃

Exercise 1: Processes and File Access

```c
#include <fcntl.h>
#include <stdlib.h>

int main() {
  pid_t child = fork();
  int fd = open("file.txt", O_WRONLY);
  if (fd == -1) {
    exit(EXIT_FAILURE);
  }
  write(fd, "this is parent or child.", 25);
  close(fd);
  return 0;
}
```

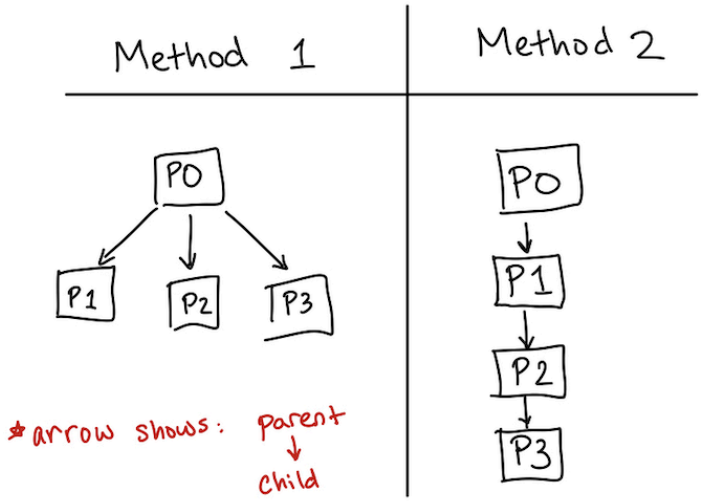
Questions to answer:

- Which processes have access to `file.txt`?
    a) Parent
    b) Child
    c) Both
    d) Neither

- If the parent closes the file, can the child still write to `file.txt`? **Explain your answer**.

Exercise 2: The Process Family Tree

Here are two diagrams, where each labeled box represents a process. P0 is the "original process" that forks P1. Arrows show the parent-child relationship. The order of processes spawning from first to last is: P0, P1, P2, P3.



Questions to answer:

- Using either C code, psuedocode, or a written description, describe how you would fork 3 processes to achieve diagram 1 and diagram 2.

Diagram 1	Diagram 2

- Let's say I have 3 independent tasks: T1, T2, and T3.
    - P1 will exec T1
    - P2 will exec T2
    - P3 will exec T3
    - P0 must wait until T1, T2, and T3 have finished.

  Which diagram will result in the faster runtime? Explain your answer.

Exercise 3: Waiting

```c
int main(void){
  int level_1 = fork();
  if (level_1 == 0) {
    int level_2a = fork();
    if (level_2a == 0) {
      printf("A");
    } else {
      wait(NULL);
      printf("B");
    }
  } else {
    int level_2b = fork();
    if (level_2b == 0) {
      printf("C");
      exit(0);
    }
    printf("D");
  }
  printf("0");
  return (0);
}
```

Questions to Answer:

1. Draw a diagram of all processes and clearly indicate all parent-child relationships. You may model your diagram after the one shown in Exercise 2, if you would like.

2. Which of the following are possible outputs? Select all that apply:
   a. B0AC0D0
   b. D0CA0B0
   c. D0A0B0C
   d. CAD00B0
   e. ABCD000

Exercise 4: Good Style 😎

Read through the style guide here:
https://www.seas.upenn.edu/~cis5480/25su/documents/style

Questions to Answer:

- What style guides did you learn from reading the style guide and plan to use before turning in Penn-Shredder?

- Are there any style guidelines that are confusing, or that you think don't actually contribute to good style? If so, explain what you find confusing, or what seems unhelpful.

Exercise 5: Exit Questions

From 1-5, answer the following:

How fast is the recitation pacing?

(not fast) 1 2 3 4 5 (fast)

How helpful is the recitation lecture portion?

(not helpful) 1 2 3 4 5 (helpful)

How fast is the recitation worksheet portion?

(not helpful) 1 2 3 4 5 (helpful)

Would you like to see more practice, or more content-review?

- Content review!
- Practice!
- There's a good balance of both!

Any feedback?

Mark any topics you would like to see/practice next week

- Wait versus Waitpid
- Masks
- Handlers
- Pipes
- File descriptors
- Debugging (GDB or Valgrind)
- Other: _____